University of Minnesota
Law School

Legal Studies Research Paper Series
Research Paper No. 14-38

Deterrence of Wrongdoing in Ancient Law

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DETERRENCE OF WRONGDOING IN ANCIENT LAW

Abstract: Ancient laws addressed all types of wrongdoing with a single set of remedies that over time pursued a changing mix of retaliatory, punitive and compensatory objectives. In this paper, we consider the historical transition from retaliatory to punitive justice, and the subsequent transition from punitive to compensatory justice. This paper shows how the optimal level of enforcement varies under the three corrective regimes. Crimes that create a larger net social loss require lower levels of enforcement under retaliatory regimes. The optimal level of enforcement is instead independent of the degree of inefficiency of the crime when punitive and compensatory remedies are utilized. The paper provides several historical illustrations and sheds light on some of the legal paradoxes of ancient law.

JEL classification: *K13, K14, K42*
Keywords: *retaliation, optimal enforcement, deterrence, ancient law*

Deterrence is among the principal objectives of modern legal systems in a variety of disparate subject areas. For example, the criminal law seeks to deter individuals from undertaking certain "wrongs"; tort law seeks to deter individuals from exercising less than due care when engaging in risky activities; environmental law seeks to deter pollution of the environment, and contract law seeks to deter individuals from reneging on promises. Indeed, broadly interpreted, the deterrence objective may be transposed to nearly every realm of human activity in which the law manipulates incentives to influence behavior.

So fundamental is the concept of deterrence to the law, it may easily be imagined that the very first legal institutions were created with this precise purpose in mind. Yet framing the function of law in terms of deterrence has not historically been regarded as intuitively obvious. Even in criminal law, arguably the most natural application of the deterrence rationale, legal scholars are still today in disagreement about whether deterrence matters,[5] or indeed whether deterrence *should* matter.[6] Thus, it is unlikely that

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[5] *See, e.g.*, von Hirsch, et al. (1999); Langan & Farrington (1998); Farrington, Langan & Wikstrom (1994); and Gendreau, Goggin & Cullen (1999) (finding that increasing prison sentences actually correlated with a 3% increase in recidivism). *See generally* Webster & Doob (2012) (surveying the empirical research contradicting deterrence theories' predictions) and Tonry (2008).
[6] *See, e.g.*, Kant (1965); Lewis (1953); Duff (1986); and von Hirsh (1993).

protean legal institutions consciously embraced deterrence as a policy objective. Nevertheless, we find that in many cases modern legal systems have evolved not only to effect deterrence, but indeed to incentivize *efficient* levels of deterrence; this begs the question how the law evolved to so precisely achieve the deterrence objective in such a wide variety of contexts without necessarily recognizing it explicitly.

In this chapter, we explore the evolution of deterrence in ancient law. We shall offer a combination of historical, comparative, and economic analyses in identifying the salient forces at work in the emergence, development, and refinement of the deterrence objective in primitive legal systems. We begin in Section 1 with a description of the evolutionary and cultural origins of "wrongdoing" and the desire for revenge in economic terms. We trace the historical development from these inherited biological traits to the intertribal norm of *lex talionis*. In Section 2, we analyze the deterrent effects of the principles of *lex talionis*. In Section 3, we describe the economic pressures that effected a shift from communal liability to individual liability. In Section 4, we describe the evolution of compensatory damages from the principle of *lex talionis*, which would later develop into the modern law of torts. Section 5 traces a parallel branch of legal evolution, describing the emergence of criminal law from *lex talionis*. We conclude with some general remarks on the role of the deterrence objective in the formation and maturation of law.

1. "Wrongdoing" and Retribution

Let us postpone defining what "wrongs" are and provisionally assume the naïve view that wrongs are offences under some exogenously determined standard. Instead, let us focus our attention on the effect that *wronged individuals* tend to desire vengeance. We begin our analysis by asking *why* victims of wrongs seek to "repay" the disutility they have suffered by causing disutility to their injurers. One plausible hypothesis is that victims of wrongs experience positive utility from vengeance, and that "revenge" is simply the product of private utility maximization.[7] The utility they get from vengeance outweighs the cost of undertaking revenge activities. Recent psychological research seems to indicate that this explanation is dubious, finding that individuals tend not to experience greater happiness after exacting revenge.[8] However, the hypothesis may be partially recovered by distinguishing between the pursuit of revenge and its result: we may plausibly suppose that the act of exacting revenge itself provides utility, though the end state of having achieved revenge may not. The fact that individuals tend to seek revenge seems to reveal that they perceive the *pursuit* of revenge at least to be a desirable activity.

[7] Posner (1980), p. 27 seems to suggest something like this.
[8] *See, e.g.*, Carlsmith, Gilbert & Wilson (2008), finding that successful revenge tends to generate disutility for the avenged.

To explain this preference, we find the argument from evolutionary psychology persuasive: that individuals have a biologically inherited predisposition toward retaliatory behavior, manifest by the sense that offending parties *deserve* retaliation for perceived offenses. Naturally, knowing that victims will have a predisposition for revenge creates an expected cost for would-be injurers, which deters "wrongful" conduct, thereby reducing the incidence of wrongs and improving the welfare of would-be victims.[9] Fon & Parisi (2005) show that this behavior can lead to equilibria with low rates of "wrongful" conduct.[10]

When an individual from one tribe harms an individual from another tribe, either because the act of harm itself creates utility for the injurer, or because injury results as the byproduct of some other activity that creates utility for the injurer, an externality arises. If members of the victim's tribe desire revenge as a consequence of the injury, then their utility-maximizing choice will often be to retaliate, causing harm to the injurer, reducing the benefit extracted from the activity.

We may describe the utility of the injurer by the function:

$$U_I(w) = B(w) - C - \pi\rho(\kappa), \tag{1}$$

where $B(w)$ is the benefit of the harmful activity, w is the activity level, C is the opportunity cost, π is the probability of revenge being triggered, and $\rho(\kappa)$ is the magnitude of revenge, given the revenger's investment in revenge κ. Clearly, when $\pi\rho > B - C$, the rational prospective injurer will choose to engage in some other activity. That is, he will be *deterred* from the harmful activity.

We may describe the utility of the victim by the function:

$$U_V(\kappa) = -H(w) - \kappa, \tag{2}$$

where $H(w)$ is the magnitude of harm, and κ is the cost of exacting revenge. Let us assume that revenge is costly, but that it creates a greater cost for the injurer than the revenger. That is, $\frac{\partial\rho}{\partial\kappa} > 1$. However, assuming that the game is played sequentially, such that injurers move first and victims respond, it seems that the rational choice for injurers is not to seek revenge. That is, $\max_{\kappa} U_V = 0$. This result is true for one-shot interactions, but does not hold for repeat interactions, where an investment in $\kappa \gg 0$ may leads to a reduction in equilibrium of w over multiple rounds of play, resulting in better long-run payoffs than a strategy of $\kappa = 0$.

It is plausible that our prehistoric ancestors were incapable of making such conclusions. The absence of abstract language in early humans or limited cognitive

[9] It is relatively straightforward to understand how such a phenotype would be selected. *See, e.g.*, Chagnon (1988); Jacoby (1983).

[10] We think the intuition underlying this analysis to be reasonably straightforward. Readers interested in the details of the formal analysis should consult Fon & Parisi (2005). See also Posner (1988, p. 27).

faculties in pre-human hominids may have rendered the information cost of rational deliberation in repeated games prohibitive. Yet if we modified equation 2 so that the act of exacting revenge generated utility $r(\kappa)$, such that $\frac{\partial r}{\partial \kappa} > 1$ for an interval $(0, n]$, then some level of revenge-seeking would maximize the function:[11]

$$U_I^R(\kappa) = -H(w) - \kappa + r(\kappa). \quad (3)$$

Such behavior would improve the long-term prospects of tribes, facing repeat interaction with neighboring tribes. It is therefore plausible that such a revenge-preferring phenotype would tend to succeed through a process of natural selection.[12]

We may observe this protean form of "retributive justice" manifested in a variety of primitive societies.[13] For example, the informal intertribal law of Native American communities consisted, in many cases, exclusively of the "law of revenge."[14] Biblical accounts also describe revenge-motivated "justice" in early Judeo-Christian society.[15] The honor value of "blood revenge" also figured prominently in norms of ancient Athens,[16] Arab society,[17] as well as in pre-modern Japanese society.[18] Indeed, nearly all legal systems seem to have sprouted from the seed of satisfying the pre-legal desire for vengeance.[19] It happened nearly the same in Roman law that later developed a set of rules that has served as a model source of law in several Civil law countries for many centuries after the fall of the Roman Empire, until the age of the modern codifications.[20] At the beginning of the Roman legal experience the victim had the right to revenge, although retaliatory justice was administered under the control of the community.[21]

This begs the inquiry: how exactly did the desire for vengeance mature into a social norm and later into a basis for law? In addition to the innate desire for revenge

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[11] The literature on "negative reciprocity" is very well developed. For more a more detailed discussions of this topic, *see, e.g.*, Güth, Schmittberger & Schwarze (1982), Camerer & Thaler (1995), Roth (1995), Falk & Fischbacher (2006), and Falk, Fehr & Fischbacher (2008).

[12] Parens (2014, p. 170).

[13] Though for present purposes, we may describe the desire for revenge as retributive, it bears distinguishing revenge from retribution. Retributivists in the philosophy of punishment nearly unanimously distinguish retribution from revenge. *See* Moore (1997) p. 89. We do not wish to err in conflating revenge and retribution. Therefore, we intend special emphasis to be understood in our use of the qualifier "protean" here. Though retribution is not conceptually identical with revenge-seeking, we think notions of retributivism in moral philosophy arose from the pre-philosophical desire for revenge as a historical matter.

[14] *See, e.g.*, Blackburn (1980); Chagnon (1988); Hudson (1976); Reid (1970).

[15] *E.g.*, Genesis 4:10-24; Proverbs 6:13; II Samuel 12:13-18.

[16] Allen (2001) ("Anger was thus assumed to be not only the source of particular punishments but also at the root of law itself. The Athenians accordingly felt relatively little uncertainty or unease about why (that is, in response to what causes) they punished: they acted in response to anger.").

[17] Ginat (1997).

[18] Mills (1976).

[19] An interesting exception may be observed in Indian culture, where incapacitative objectives seem to have been primary in the development of criminal and tort law. *See* Das Gupta (1930); Doongaji (1986); Olivelle (2011).

[20] *See* Manthe (2000, p. 55-56).

[21] Jhering, (1906, 118).

identified by evolutionary psychology,[22] we observe notions of desert and retribution taking shape in early societies, reinforced intra-tribally through "duty" and "honor" norms, often bolstered by religious rules.

Though the evolutionary basis for revenge-seeking is clear from the game-theoretic analysis, this alone is not sufficient to explain why communities embraced it as a desirable practice. It does not follow that activities which are explainable through biological evolution are necessarily reified as social norms.

To understand a community's motivation for adopting a social norm of revenge-seeking, we note that wrongs were not regarded, insofar as "justice" was concerned, as perpetrated by or against individuals. Instead, the family, clan, or tribe was regarded as being collectively responsible for wrongs committed by members and for the retaliation of wrongs committed by other tribes.[23] Tribe members who failed to exact vengeance for a wrong were regarded by their community as dishonorable and faced intra-tribal social sanctions.

Suppose that a member of a revenge-seeking tribe had the utility function described in equation 2. That individual could free-ride on the revenge efforts of his fellows, enjoying the benefit of the deterrence that they generated by investing in revenge, while expending less or no κ himself.

This situation is analogous to a cartel game. For any given individual, the benefit of defection will tend to generate greater benefits (i.e., the effort not dissipated by participating in communal revenge) than the loss due to decreased deterrence (i.e., the reduction in protection from deterrence). By not participating in revenge-seeking, such an individual could improve his utility at a cost to the tribe. Thus, the social norm of revenge-seeking reinforces the utility derived from revenge (for individuals who possessed idiosyncratically weak revenge-seeking preferences), while reducing the utility of free-riding (by imposing intra-tribal social sanctions).

This process of social reinforcement begins the transformation from biologically motivated preference into social norm. Yet the road to legal rule is only just begun. Historically, the bare retaliation norm tended to be a short-lived stage of development.[24] Bare revenge, though it solves the repeated game problem, is a potentially catastrophic norm. When a multiplier is attached to retaliation (i.e., when $\rho = aH$, where $a > 1$), a revenge act may be regarded as a fresh offense by the original injurer, leading to spirals of escalating revenge.

Initially, a "kind-for-kind" restriction arose to constrain the *type* of retaliation warranted by the harm suffered. The kind-for-kind constraint restricts the scope of

[22] *See* Joyce (2006).

[23] *See* Posner (1980) for a detailed description of the communal unit in primitive societies and an economic explanation for its development. For the role of communities in specific primitive societies, *see also* Blackburn (1980); Chagnon (1988); Hudson (1976); Reid (1970); Mills (1976).

[24] At this stage of development, it is dubious whether retaliation is even a social norm – we think it something intermediate between an evolutionary instinct and a social norm.

available retaliatory options to *like* harms. For instance, theft warranted revenge-theft, and killing warranted revenge-killing. The kind-for-kind constraint is later reinforced by the notions of "desert" and "talis" (equal in kind) captured by the etymology of the word "talio" (retaliation) in ancient Roman law. These social norms helped to tame the useful but potentially volatile revenge impulse. Yet, though early norms constrained retaliation as kind-for-kind, limitations on magnitude arose only later.[25]

Legal scholars describe this initial stage of development, when the norm of kind-for-kind retaliation became established, as "discretionary retaliation." If the member of one tribe harmed the member of another tribe, the offended tribe was obliged to seek like vengeance (of variable magnitude) upon the offending tribe. The retaliatory conduct at this stage was still often subject to an arbitrary multiplier. For instance, Genesis 4:14 states, "[W]hosoever slayeth Cain, vengeance shall be taken on him sevenfold." Similarly, II Samuel 12:13-18 prescribes a four-fold measure, while Genesis 9:5 prescribes a two-fold measure.[26] Though it constrained the type of revenge-harm, discretionary retaliation could still lead to an escalating infliction of reciprocal harms. For example, one group, regarding the retaliation of another group as unwarranted or excessive, might *counter*-retaliate with vengeance of greater magnitude, inciting the other group to *counter-counter*-retaliate with vengeance of yet greater magnitude.[27] Such cycles of increasing violence would clearly be undesirable for the participants in the long run, and discretionary retaliation norms tended to evolve limitations on the permissible magnitude of retaliation.[28]

The second stage of development is characterized by the emergence of the *lex talionis* norm – that retaliatory harms should be equal in magnitude to the harms suffered, popularly captured by the phrase, "an eye for an eye." This development had the obvious benefit of preempting the mechanisms that led to devastating spirals of reciprocal violence. It is at this stage of social development that moral conceptions of *desert* and *retribution* began to take shape. The impulse to strike back transforms into a sense that harms are "moral wrongs," for which an *equivalent* retaliatory harm is "owed." In economic terms, the inchoate moral calculus implicit in this new norm acted as an upper bound on ρ, such that $\rho \leq H$.

It is easy to see why the upper bound of *lex talionis* is an improvement over unbounded ρ. First, it reduces excessive expenditure on κ on the victim's side, which generates over-deterrence when $\rho > H$. Second, it sets a benchmark for proportional

[25] Blau (1916, p. 7).
[26] Interestingly, Sulzberger (1915, p. 33) analyzes the two-fold measure as arising from the doctrine of "double blood-guilt." The retaliation is given twice: once for the individual injurer, and again for the injurer's tribe for failing to prevent or punish the crime internally.
[27] *See* Parisi (2001).
[28] The escalation of blood feuds is commonly observed in societies with discretionary retaliation norms. *See, e.g.,* Richter (1992) on escalating "mourning wars" between Iroquois tribes. Parisi (2001) suggests several elements that may lead to escalating retaliatory actions, including variations in the perceptions of blameworthiness of a wrongdoer, and overestimation of the gravity of harm suffered.

retaliation, against which injurers are neither inclined nor obliged to counter-retaliate. Third, it eliminates the mechanism for spiraling retaliations of increasing magnitude.

Talionic law was an important development in the formalization of early legal institutions. In addition to specifying the magnitude of liability (the distinction between criminal liability and tort liability had not yet developed), procedural clarifications facilitated the orderly execution of talionic retaliation. In the biblical tradition, the institution of *Go'el* (nearest of blood) determined the right of the victim and his extended family to exact vengeance.[29] This effectively reduced coordination problems that arose in the discretionary retaliation paradigm, when it was often unclear upon whom the duty to exact revenge fell, possibly leading to duplicative efforts/harms.

The exceptional case of ancient Indian law follows a similar history of formalization. Though Indian law was anomalously based not on retributive, but rather incapacitative grounds, its early development included a comparable systemization of consequences, specifying upper bounds for punishments. For example, the harshest punishment for theft was dismemberment of the hands. Though this may seem draconian by modern standards, it is important to recognize that the function of this formal rule was not to expand, but rather to delimit the magnitude of available remedies. The king (ideally an impartial official) was also specified as the legal executor of punishments, with procedural constraints imposed by the Brahmins, further reducing the risks of overinvestment in punishment.[30]

Although the second stage of development is characterized by the emergence of the principle of *lex talionis*, several other important changes in the proto-legal institutions of primitive societies may be observed. Firstly, codification and increasing formalization of the law, which not only specifies the measure of retaliation due, but also delimits the duties and rights of parties after the occurrence of a harm. Secondly, and more abstractly, it should be observed that the rationale underlying retaliation transformed from the pre-legal, primordial desire for revenge into a moral prescription for desert. It is also important to notice that in economic terms, the principle of *lex talionis* crudely assigns a measure of retaliation equal to the harm suffered, $\rho \leq H$, thus forcing potential injurers to internalize the cost of their "wrongdoing." It thus approximates, however crudely, something approaching an efficient measure of deterrence.

In its earliest period, Roman law applied talionic law for cases of *iniuria*, including the case of intentional injury to another with the breaking of a limb or a bone or insult.[31]But in a different case Romans admitted also a non-proportional retaliation. The Twelve Tables, an archaic law promulgated in the V century B.C., prescribed that the

[29] Good (1967).

[30] *See* Jaishankar and Haldar (2004), Das Gupta (1930); Doongaji (1986); Olivelle (2011).

[31] Law of the Twelve Tables, Table 8.2: "*Si membrum rup[s]it, ni cum eo pacit, talio esto*" (if a victim is maimed, then in the absence of compensation, retaliation is in kind).

victim could lawfully kill the thief, if he had been caught in flagrant and was operating at night.[32] The murder was the lawful reaction for theft.

It is also possible to ascribe to a legalization of vengeance the first personal compulsory settlement that the Romans ordered in the Laws of Twelve Tables, the *manus iniectio* (laying of a hand upon a person).[33] This procedure authorized a private citizen to formally arrest the debtor, if – without giving a guarantor (*vindex*) – he did not present itself at the trial as defendant or, independently from the trial, he did not fulfill his debt.[34] The creditor could sell the debtor as *addictus* (slave upon the discharge of his debt), but if there was no buyer found at the market, the creditor could lawfully kill him .[35] The cruel eventuality to cut the corps of the debtor into pieces was probably related to the case in which there was more than one creditor.[36]

These conceptual transformations were important ones. Recall that the predisposition to seek revenge seemed best explained in evolutionary terms as a means of effecting *deterrence*. This biologically successful phenotype was tamed by social practice into a *retributive* ground for retaliation. Yet this transformation brought us full circle back to what appears to be a crude attempt at effecting optimal *deterrence*, revealing the mechanism likely at work in effecting the institutional changes.

This evolution of the grounds for punishment suggests a closer relationship between retributive and deterrence theories than many scholars have hitherto supposed.[37] Rather than being two competing objectives of the criminal law (and to a lesser extent, tort law), "retribution" may thus be regarded as a refinement of the deterrence objective achieved through social norms.

2. "Wrongdoing" and Deterrence

Many features of *lex talionis* suggest that it was a far more dynamic system than often supposed, designed to take into account more complex elements, such as general deterrent value, enforcement errors, and specific enforcement problems. As we remarked

[32] Law of the Twelve Tables, Table 8.12: "*Si nox furtum faxsit, si occisit, iure caesus esto*" (If the theft has been done at night, if [the owner] kills the thief, [the thief] shall be considered to have been lawfully killed).

[33] Law of Twelve Tables, Table 1.1: "*Si in ius vocat, i[t]o. Ni [i]t, antestamin[o]: igitur en capito*" (When [the plaintiff] brings a case against [the defendant] before the court, [the defendant] should appear. If [the defendant] doesn't appear for trial, [the plaintiff] should call the witnesses. Afterwards he should catch him [the defendant]).

[34] Kaser (1971, p. 132.

[35] Law of Twelve Tables, Table 3.5: "*Tertiis nundinis partis secanto. si plus minusve secuerunt, se fraude esto*" (On the third market day they ought to cut off pieces of the corps. Whether they have cut off too much or too little, should be left unpunished).

[36] Talamanca (1990, p. 293).

[37] Though a substantial number of "mixed" theories of punishment have recognized the close relationship between retribution and deterrence rationales. Von Hirsch & Ashworth (2005), Duff (1986), Moore (2007).

earlier, the ancient body of laws dealing with "wrongdoing" treated both tortious and criminal behavior as one, often without distinguishing between intentional, culpable or accidental wrongdoing (Cairns and Robinson, 2001). Modern legal systems, with their separate treatment of torts and crimes, tailor remedies according to the intentional or non-intentional nature of the act, generally pursuing goals of *absolute deterrence* through criminal remedies (teaching prospective wrongdoers that "crime does not pay"), and goals of *relative deterrence* through tort remedies (teaching prospective tortfeasors that "precautions pay"). Specifically, modern tort law forces wrongdoers to compensate the victim for the harm suffered (H). By contrast, modern criminal law creates deterrence by imposing sanctions S based on the benefit enjoyed by the injurer B and the probability of detection, p, oftentimes irrespective of H. In modern criminal law the sanction is tailored to the incentives of the criminal. For example, thefts of sheep for slaughter or for work are both punished as thefts; that is, the punitive element of the sanction is the same. Deterrence is achieved when the benefit to the wrongdoer is less than the probability of enforcement multiplied by the sanction, i.e. $B < pS$, where S is independent of H. This difference between criminal law and tort law influences the effects of the two remedial regimes: modern tort law pursues goals of relative deterrence ("precautions pay") by forcing the internalization of the loss H, while criminal law pursues goals of absolute deterrence ("crime does not pay") taking into account the criminal's temptation to commit the crime, B.

Talionic regimes do not bifurcate remedial instruments and tackle both objectives of criminal and tort remedies at once. By replicating the harm suffered by the victim onto the wrongdoer, and giving the parties an option to settle through the payment of blood-money (*kofer*), *lex talionis* provided a hybrid remedy that led parties to take into account both the harm to the victim and the benefit to the wrongdoer.

As will be discussed below, the effectiveness of the talionic regime hinges upon the ratio of the benefit to the offender to the harm that he caused. Talionic law looks at the ratio B/H to achieve punitive and compensatory goals. Since the sanction is tied to the loss to the victim, and because it is the victim's (or his tribe's) right to impose this penalty, both the victim's loss and the benefit to the wrongdoer are ultimately taken into account, balancing objectives of absolute and relative deterrence looking at the ratio between B/H. The figure below illustrates how the talionic system relates to its tort and criminal law alternatives.

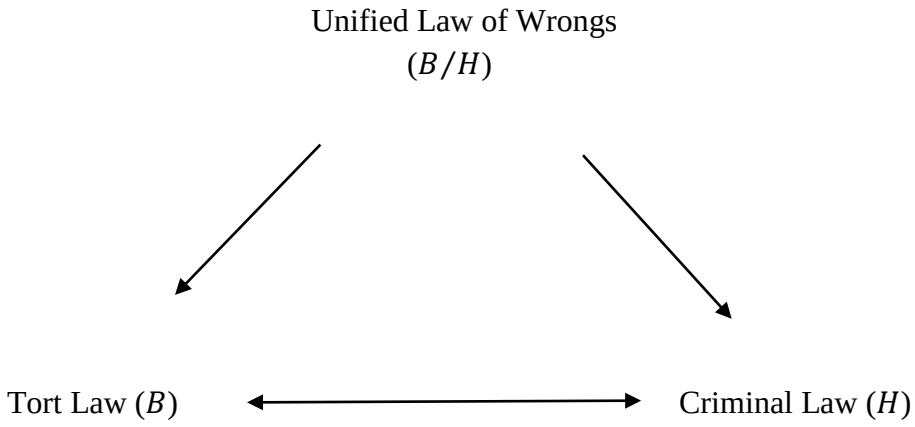

Figure 1: *Deterring Wrongdoing*

When different instruments are available to pursue relative deterrence of unintentional wrongdoing through tort remedies and absolute deterrence of intentional wrongdoing through criminal remedies, problems of deterrence spillovers across different categories of wrongdoing can be reduced and enforcement levels can be tailored to the respective policy objectives (Parisi, 2001, 2004).

When a single set of remedies is adopted, the choice of optimal enforcement levels becomes essential for the pursuit of effective deterrence. Prior to the *lex talionis* regimes, where kind-for-kind was the only requirement for punishment, multipliers were used for retaliation: the punishment imposed on the wrongdoer was more severe than the harm originally suffered by the victim (Sulzberg, 1915). When the *lex talionis* imposed a measure-for-measure limit to the punitive remedy, possible situations of underdeterrence could emerge.[38] With enforcement errors, only a fraction of wrongdoers would be caught and punished, and prospective wrongdoers could expect to face retaliatory punishment only a fraction of the time.

The relationship between retaliatory punishment and deterrence is particularly interesting when considering enforcement levels.[39] With retaliatory punishment, a lower level of enforcement is needed to deter inefficient crimes. Retaliatory punishment instead becomes less effective in deterring efficient crimes. To understand the "deterrence paradox" of retaliatory punishment with enforcement errors, it is necessary to take into account the disparity between the benefit achieved by the wrongdoer and the expected cost of punishment. With retaliatory punishment, deterrence is preserved for inefficient

[38] Blau (1916, p. 7)
[39] See Czabanski (2008, chapter 4) for a discussion of the relationship between retaliation and deterrence in ancient law. See also Stein (1999).

crimes, but underdeterrence may arise for relatively "efficient" crimes (i.e., those crimes for which the benefit to the injurer is equal or greater than the harm to the victim). Retaliatory punishment thus links the harm to the offender to the harm suffered by the victim. When the multiplier α is equal to one and with a less than 100% enforcement rate, deterrence cannot be achieved for efficient crimes.

Unlike the internalization of the harm in tort law, absolute deterrence of crime requires offsetting the offender's benefit with a threat of punishment. Deterrence should teach the wrongdoer that crime does not pay. A rational criminal should be adequately deterred if the benefit from the crime, B, is less than the expected sanction, equal to the probability of enforcement, *p*, times the sanction *S*.

$$B < pS$$

Under *lex talionis* regimes, the sanction S is set equal to the victim's loss H. Hence, enforcement should occur with a probability *p*, such that

$$p > B/H$$

Crimes are generally inefficient. This is because the benefit that the wrongdoer captures from committing the wrong is generally less than the cost he imposes on the victim, $B < H$. As a result, a wrongdoer would not generally agree to suffer retaliatory punishment in exchange for the right to impose harm on his victim. The degree of inefficiency of a crime can vary greatly, $0 \leq B/H < 1$. Lower values of B/H indicate "more inefficient" crimes.

Despite the mechanical proportionality of retaliatory punishment (i.e., more malicious crimes lead to more malicious sanctions), $S = H$, it is interesting to observe that, as H increases relative to B, the enforcement level necessary to preserve adequate deterrence actually decreases. When enforcement is imperfect, it becomes rational for some wrongdoers to carry out some wrongful activities, and the wrongs that will be rationally perpetrated will be those that are generally less inefficient (i.e., those characterized by higher values of B/H).

The deterrence paradox is easily found in early legal rules.[40] The crimes mentioned in the early codes that impose measure-for-measure retaliatory punishment (murder, mutilation, wounding, etc.) are crimes that generally take a lot from the victim and give a smaller benefit to the perpetrator. For example, the crimes covered by the *lex talionis* are characterized by lower values of B/H. The optimal enforcement necessary to ensure deterrence ends up being lower for the most inefficient crimes. For these crimes,

[40] See Kavka (1978) for a discussion on the emergence of deterrence paradox. See also Fagan and Meares (2008) focusing on the deterrence paradox in minority communities.

enforcement level could be kept low, without compromising effective deterrence. Policing and enforcement of brutal crimes could be kept low, while policing of less violent crimes would paradoxically need to be boosted.

Contrary to a retributivist view of punishment, given that policing and enforcement are costly, when retaliatory penalties are utilized, more serious crimes should be enforced less rigorously. As the deadweight loss of the crime becomes smaller (i.e., when B/H goes up), society should instead strengthen policing and enforcement measures. Paradoxically, this means society should devote more resources to deter efficient (i.e., less inefficient) crimes, or else adopt a different standard of punishment.

The foregoing analysis further explains why early legal systems did not apply the measure-for-measure cap on punishment to crimes that entail a larger prospective benefit for the wrongdoer (Parisi, 2001). The optimal enforcement necessary to ensure deterrence in such cases would be higher. One could imagine crimes such as theft where the benefit to the victim approaches the sanction in a kind-for-kind regime such as *lex talionis*. To promote adequate deterrence, early legal systems adopted higher $\alpha > 1$ in the case of theft, to account for the lack of deterrence inherent to theft.[41] This ensured that the ratio B/S would still be below the probability of enforcement. A measure-for-measure requirement for theft would have been futile here, while for violent crimes it would have been effective. Within the confines of theft, further adjustments were made to correct for possible detection problems. These deterrent aspects of *lex talionis* are further implicated by the higher penalties for animals marked for slaughter than animals for work. For example, animals intended for slaughter had a higher multiplier than those marked for work. Sheep had a multiplier of 5:1, while oxen had a multiplier of 4:1.[42] This is due to the specific detection problems with respect to animals intended for slaughter. Animals for slaughter may likely be stolen and perhaps eaten shortly after their theft. The perpetrator could literally swallow the evidence. Animals for work, however, may be recognized by a unique brand or other individual characteristics of the animal. Since the probability of enforcement was necessarily lower for slaughter animals, the *lex talionis* regime compensated by increasing the ratio of B to H making enforcement less necessary for adequate deterrence, once again suggesting an understanding of the role of B/H in ancient times.

Yet even within the category of work animals, special exceptions were made when they considered two animals for work, both of which need to be retrained.[43] Here the animals are differentiated by loyalty. One only takes orders from the owner, thus, instructions from strangers will not be executed. Other animals would listen to the new owner immediately. A corollary today would be the difference between a dog, loyal to its owner and a horse, generally more likely to obey whomever is riding it.

[41] E.g. Maine (1861, p. 378)
[42] Exodus 22:3-4
[43] The Code of Hammurabi, paragraph 8.

Considering this problem in terms of social efficiency, we can see that the theft of an animal that one would have to retrain is less efficient. Intuitively, one would expect that theft to be more socially undesirable and it would have to be deterred more severely. However, that may still encourage crimes of animals that more easily adapt to a new owner.

In fact, to discourage theft, *lex talionis* punished thefts that required no retraining with greater multipliers. Again the B/S ratio does not look at loss to the victim, but it rather looks at the benefit to the perpetrator relative to the sanction imposed on the same perpetrator. If the prospective perpetrator can capture the full value of an animal, that is a very temping theft, or a high B value. The animals that needed to be retained had a lower B value. To compensate for the higher B value of non-loyal animals, a higher S value was implemented as well. Again, deterrence played the primary role in norms dictating the penalties of the time.

3. The Evolution of Individual Liability

The *lex talionis* principle marks a stage in the evolution of ancient law, after which civil and criminal penalties begin to diverge. Before exploring these two branches of development, we pause to consider an orthogonal development: the evolution of individual liability.

In nearly all primitive societies, there existed a clear division between intertribal and intra-tribal norms. The revenge laws governing the interaction between tribes did not necessary apply to the internal interactions of members within the same tribe. The intertribal revenge norms gradually evolved into modern legal systems. Meanwhile, intra-tribal norms grew less relevant as the influence of tribal units deteriorated. The mechanisms and relationships between these transformations are not immediately obvious and require some explication.[44]

It is important to observe that the tribal unit was essential to the development of intertribal norms, inasmuch as its dissolution was essential to the further development of individual liability. Posner (1980) discusses the dynamics of intra-tribal interactions in great detail, identifying important characteristics of primitive societies that distinguish them from modern societies. First, life in primitive societies was characterized by an extreme scarcity of resources. Second, information costs were prohibitive in many situations. And third, government was either weak or nonexistent.

These factors entailed important consequences. Due to the scarcity of resources and high information costs, tribes served an important and desirable insurance function. By pooling resources, individuals were better equipped to weather risks. To counteract the lack of centralized government and high information costs, tribes lived in close-knit communities. By living in crowded conditions lacking privacy, where each individual

[44] For a detailed formal discussion of this topic, *see* Parisi & Dari-Mattiacci (2004).

knew what other members of the tribe were doing (while also being monitored by other members of the tribe), information costs were effectively reduced, leading to an informal, decentralized reciprocal surveillance.[45]

It is the dual functions of insurance and self-policing that allowed intertribal revenge norms to develop. Assigning liability not upon individual wrongdoers, but instead upon the wrongdoers' *tribes* allowed ancient societies to overcome the detection and solvency problems that would have attended individual liability. Moreover, the structure of primitive societies amplified the deterrence effect of intertribal retaliation, because tribes were incentivized to exercise collective "self-control" over their members to avoid the shared burden of retaliation.

Historically, the constraints of *lex talionis* tended to be pursued with an absurd degree of fidelity to the rule. For instance, in the Native American "law of revenge," it was the right of the wronged tribe to inflict retaliation – identical in kind and magnitude – for harms suffered. If this retaliation were executed by anyone except a member of the injured tribe, however, that act would not be recognized as retaliatory, but regarded as a fresh wrong requiring its own retribution.[46] Biblical and Babylonian implementations of *lex talionis* required an even more extreme formal symmetry in the acceptable retaliatory act: A man who causes the death of another man's child is to lose his own (Daube 1947b, p. 169);[47] the wife of a rapist is to be raped by the victim's family (Middle Assyrian Laws, Paragraph 55);[48] and if a building collapses, killing the owner's son, then the builder's son is to be put to death (Code of Hammurabi, Paragraph 230).

However, as the environmental constraints motivating communal liability, identified by Posner (1980), diminished over time, so too did the effectiveness of intra-tribal punishments in deterring harms. For example, Parisi & Dari-Mattiacci (2004) formally deduced that as a tribe's wealth and population increased, common pool problems, moral hazard, and free rider problems tended to increase as well, diminishing the deterrence effect of communal liability.

This conclusion is easy to grasp intuitively. While we may suppose that the utility that an individual gains from harming (or risking harm to) individuals of another tribe is indifferent to changes in wealth or population, the decreasing share of communal liability

[45] However, due to the strongly aligned interests of individuals and their tribes, it is doubtful whether internally committed wrongs were punished. *See* Faris (1915), pointing out that the patriarch of a tribe has little incentive to punish members of his own tribe.

[46] Thus, the law of revenge was intransitive. For example, if *Tribe A* injures *Tribe B*, and *Tribe B* injures *Tribe C*, and *Tribe C* injures *Tribe A*, then the owed retaliations do not cancel out. Rather, *Tribe A* must retaliate against *Tribe B*, *Tribe B* must retaliate against *Tribe C*, and *Tribe C* must retaliate against *Tribe A* for "justice" to be satisfied.

[47] Similarly, *see* Code of Hammurabi, Par. 210 (requiring that the daughter of a man who strikes a pregnant woman and causes a miscarriage be put to death).

[48] *See* Roth (1995, pp. 174-175).

for each individual as the population increases in size reduces that individual's expected costs from committing the wrong.

To illustrate the point by use of an extremum case, contrast the impact of retaliation against a tribe, consisting of a dozen individuals who all provide essential functions to the community, versus retaliation against a wealthy tribe, consisting of many hundreds of individuals, some of whom are only distantly acquainted with the would-be injurer. It should be intuitively obvious that the cost of communal liability in the latter case is substantially less than in the former. Thus, as a consequence of increased wealth and population, the individuals' interests will tend to diverge from the social optimum, as incentives become misaligned.

Unsurprisingly, we do in fact observe communal liability collapsing into individual liability in our historical specimens. For example, by the sixth century BCE, communal liability was renounced in the biblical tradition: "The fathers shall not be put to death for the children, neither shall the children be put to death for the fathers" (Deuteronomy 24:16).[49]

4. The Commodification of Civil Liability

Up to this point, ancient legal systems treated liability monolithically, failing to distinguish between intentional and accidental harms. The division of tort liability and criminal liability begins to emerge with the commodification of retaliation.

Readers familiar with Coase (1960) will not be surprised, given the retaliatory right under *lex talionis* regimes, to learn that the kind-for-kind constraint eventually gave way to pecuniary compensation. In Coasean terms, the initial allocation of the retaliatory right was not assigned to the highest-valuing party. Thus, we expect the injurer and victim would bargain for a transfer of the right.

Several very plausible assumptions are implicit in this claim. First, we assume that injurers value the retaliatory right more than victims. Though individuals are indubitably predisposed to seek retribution for harms suffered (recall the discussion from Section 1), it seems likely that the desire of injurers to avoid retaliation will tend to be greater than victim's desire to exact vengeance. For example, if *A* harms *B*, resulting in the loss of a limb, then by *lex talionis*, *B* obtains the right to dismemberment of *A*. Yet it seems quite likely that although *B*'s desire to retaliate may be great (call the magnitude of his desire x), *A*'s desire to keep his body intact will be greater still (call it $y[> x]$). Thus, there will be a price p in the range $p \in [x, y]$, such that A can simply pay B not to exercise the retaliatory right, whereupon A enjoys the surplus $y - p$, and B enjoys the surplus $p - x$, assuming zero (or sufficiently low) transaction costs,[50] leading to a Pareto

[49] *See generally* Parisi (1992; 1997).

[50] Given the stakes in the hypothetical, it is plausible that transaction costs will not exhaust the bargaining space in most situations.

superior outcome: *B* gets more than the revenge was worth to him, and *A* gets to keep his limb.

In fact, we may observe such bargaining in all *lex talionis* regimes throughout history. For example, in times of peace, ancient Athenians tended to exercise compensation alternatives;[51] blood revenge was rarely carried out in practice (McHardy 2008, p. 9). Interestingly however, blood revenge remained common during times of war, when vengeance was exacted on the battlefield.[52] We may speculate that this was due to two factors. First, transaction costs during times of war may have been prohibitive. Second, since the legal right to kill enemy combatants during war was redundant with the right to retaliation, paying off the victim in exchange for one right did not prevent the victim from exercising the wartime right to kill the injurer anyway. At any rate, the Athenians seem clearly to have practiced Coasean bargaining of the right to retaliation.

Likewise, later Talmudic interpretations of *lex talionis* understood, "an eye for an eye" in compensatory terms as, "the *value of* an eye for an eye." The rationale evolved from an apparent paradox in the strict application of the kind-for-kind constraint. The rabbinic scholars point out that Leviticus 24:22 requires, "Ye shall have one manner of law," and yet the requirement, "an eye for an eye," interpreted literally would be impracticable in many cases: "What then will you say where a blind man put out the eye of another man, or where a cripple cut off the hand of another, or where a lame person broke the leg of another?" (Talmud, Baba Kamma 84a). Thus it was recognized that "an eye for an eye," must, on pain of self-contradiction, be interpreted to mean, "the *value* of an eye for an eye." Pecuniary compensation was eventually established as the exclusive form of retaliatory right, rather than a mere alternative to retaliation, in Jewish law.[53]

We observe similar commodification of the *lex talionis* principle universally in the development of other ancient legal systems, including the Roman Law of the Twelve Tables, the Visigothic Code,[54] the Salic Code,[55] and informally in the Native American law of revenge.[56] Thanks to the numerous sources that survived throughout the centuries, we can observe a similar – and very well defined – pattern of evolution in the history of Roman law. In the Roman Laws of the Twelve Tables there is a provision according to which an agreement between the parties can avoid the literal application of the *lex talionis*. The option to buy out the right to talionic revenge through the payment of a sum

[51] Demosthenes, Orationes 43.57.

[52] It is also interesting that Athenian women were less willing to accept compensation for harm, insisting on "specific performance" of the blood revenge remedy. McHardy (2008, p. 9). We speculate that this may be due to qualitative differences in the crimes committed against women in ancient Greece.

[53] Pasachoff & Littman (2005).

[54] Visigothic Code at 7.3.3 ("Should they wish to do so, they may exact from the kidnapper, the legal compensation for homicide; that is to say, three hundred solidi . . ."). *See* Scott (1910, p. 248).

[55] Henderson (1910, pp. 176-189) ("*Title LXjII.* If any one's father have been killed, the sons shall have half the compounding money (wergeld); and the other half the nearest relatives, as well on the mother's as on the father's side, shall divide among themselves."). See also Hessels and Kern (1880).

[56] See Hudson (1976), Reid (1970) and Richter (1992).

of money in cases of *iniuria* was an important step in this evolution,[57] which is often regarded as the genesis of the concept of delictual obligations.[58] The right to retaliation in kind outlives this early period throughout classical Roman law. An example is found in the case theft in flagrant (*furtum manifestum*) which became a delict that created an obligation for the wrongdoer to pay a sum of money, which was a multiple of value of property stolen. The thief could no longer be lawfully killed, but he was required to pay back the double of the value of the stolen property (or four times that value, if he was caught in flagrant).

An important turning point in the Roman history of tort was the *lex Aquilia*, a statute from the time of the Republic. This statute created for the first time the opportunity to get damages, laying the foundations for modern tort liability.[59] A distinction arises at this point between more serious crimes, such as murder or high treason, that were publicly sanctioned,[60] and other delicts, like theft, assault or wrongfully inflicted loss, that were privately prosecuted by the victim, creating an obligation for the offender to pay the victim a certain sum of money.[61]

From the compensatory scheme that evolved from the *lex talionis* principle, we begin to see the outlines of modern tort law taking shape. In economic terms, the compensatory modification approximates efficient injurer incentives.

We now analyze the efficiency of the "blood money" rule that gradually replaced *lex talionis* in criminal and tort cases. We will examine the efficiency property of blood money, distinguishing between intentional and negligent crimes. A general result is that bargaining creates an inefficient compensation measure and induces underdeterrence of criminal activity.

In the case of intentional crimes, bargaining between the offender and the victim (or victim's family) will take place only in the case of inefficient crimes, i.e. when the criminal's benefit from committing the crime B is lower than the harm H imposed on the victim. In the absence of any enforcement error, a kind-for-kind *lex talionis* regime will provide efficient deterrence, since it imposes on the criminal a sanction equal to the harm suffered by the victim, and the offender is not willing to pay to avoid the sanction. However, with inefficient crimes the offender is willing to avoid the kind-for-kind sanction since it would impose on him a greater harm than the benefit gained from the crime.

Let γ denote the victim's bargaining power. The offender is willing to pay up to $B + \gamma(H - B)$ in order to avoid the application of the kind-for-kind sanction required by the *lex talionis*. This bargaining cannot take place for efficient crimes, since the criminal

[57] Law of the Twelve Tables, Table 8.2.
[58] Talamanca (1979, p. 2-4); Scherillo & Gnoli (1994, p. 127).
[59] *See* von Lübtow (1971, p. 7); Frier (1989, p. 3); Hausmaninger (1990, p. 3).
[60] Kunkel & Schermaier (2005, 41-42); Santalucia (1989, 42-43).
[61] Kaser (1971, 609-610).

will still have a positive payoff, equal to the net benefit, $B - H$, after the kind-for-kind sanction. Bargaining between the offender and the victim takes place in case of negligent crimes, providing an insufficient compensatory measure and hence underdeterrence. In both cases, the criminal is not willing to pay more than γH, escaping the full kind-for-kind sanction, equal to H. This creates room for underdeterrence of diligent behavior, and inefficient incentives to take optimal precautions.

In the presence of enforcement errors, the underdeterrence generated by an inefficient compensatory damage measure is reinforced. Underdeterrence emerges at equilibrium and the incentive to undertake efficient precautions is diluted in the case of negligent crimes. While underdeterrence is the only possible equilibrium for negligent crimes, optimal deterrence of crime could still be achieved in case of intentional crimes. This is solely the case for inefficient crimes, when the enforcement error e is lower than the ratio of benefit to harm, i.e. $e < \frac{B}{B+\gamma(H-B)}$. Note that blood money is less frequently observed in the presence of enforcement error since the range of values that support efficient deterrence is reduced after the introduction of bargaining. For efficient intentional crimes, however, we will not observe any bargaining and the only possible way to achieve higher efficiency in the deterrence of crime is to adopt more severe sanctions, replacing a kind-for-kind sanction with higher multipliers α in order to correct for the enforcement error e. Higher multipliers α should be optimally implemented for most efficient crimes in order to counteract underdeterrence.

Several conceptual steps remain in the evolution of tort liability, separating the compensatory modification of *lex talionis* from modern tort law. These include: (1) recognition of the distinction between intentional and accidental wrongs; (2) elimination the bargaining element via the introduction of fixed remedies; (3) identification of compensation with harm; and (4) recognition of victim precautions as a fundamental element in the calculus of tort liability. However, these sophisticated changes occurred in relatively developed legal systems, which fall outside the scope of our present inquiry.

Yet it bears mentioning the durability of the blood money stage of legal development. Unlike bare vengeance, discretionary retaliation, and *lex talionis*, the mechanisms forcing further evolution from blood money are subtler and less forceful. In regimes where legal change is difficult, the relative efficiency of blood money represents a possible stopping point in the refinement of tort liability rules. Indeed, though the context of our discussion is ancient law, it is worth pointing out the persistence of blood money in modern day Sharia in the concept of *Qiṣāṣ*.[62] Likewise, in the customary law of Somalia, blood money compensation continues to be practiced. And informally, blood money compensation remains a common extralegal social practice in both Japan (*mimaikin*) and Korea (*hapuigeum*). For a more detailed analysis of the evolution of tort liability in ancient law, see Parisi (2001).

[62] El-Awa (1981).

5. The Centralization of Criminal Liability

The literature distinguishing criminal law from tort law is vast.[63] In the philosophy of punishment, retributivists (and mixed theorists) identify a putatively moral dimension in criminal conduct as the distinctive element separating crimes from torts.[64] Scholars in this field are interested in the distinction for normative reasons, seeking to answer the question what acts the state ought to punish, and what justifies punishment from an ethical standpoint. However, careless scholars may try to transform the claim into a descriptive one. If moral considerations are given as a descriptive distinction between the criminal law and the law of torts, it is difficult for such claims to avoid endogeneity problems. Even assuming that crimes necessarily punish moral wrongs, and that torts do not (already a disputable point), it is not clear whether such activities are regarded as criminal because they are immoral, or whether in at least some cases they are seen as immoral because they are criminalized.

These questions raise meta-ethical problems about the existence of moral facts, which are tangential to our present inquiry.[65] We think the historical dimension of the crime/tort distinction may be more usefully seen in economic terms. Posner (1980) takes the strictly instrumental view that the crime/tort distinction is a function of wealth, government, and information costs. As we discussed earlier, *lex talionis* norms taking the tribe as the bearer of liability developed due to the high costs of detection, lack of state authority, and the lack of wealth needed to compensate victims.[66] Given these constraints, the legal instruments of modern criminal law and tort law would have been impracticable.

As wealth increased in ancient societies, the possibility of compensatory payments emerged, and *lex talionis* was modified to allow compensation as an alternative to reciprocal retaliation. As discussed in the previous section, this innovation evolved into tort law. However, state authority tended to become established concomitant with increases in wealth, allowing state enforcement and sanctions to emerge from the undifferentiated liability of *lex talionis*. This branch of development led to the development of the criminal law.

The relationships between economic development, population growth, and the evolution of criminal law are complex. Increasing wealth and population allowed for the establishment of more efficient deterrence mechanisms, such as the compensatory scheme discussed in the previous section. Yet these more efficient rules contributed to greater predictability, stability, and wealth for those communities, which in turn allowed

[63] *See, e.g.*, Morris (1933), Posner (1980), Coffee (1991), Epstein (1997), Weinstein (2001), and Simons (2008).
[64] *See, e.g.*, Husak (2008), Von Hirsch & Ashworth (2005), Moore (2007).
[65] The denial of moral facts is central to a large number of skeptical theories. A particularly influential and clear account of one variant – moral error theory – may be found in Mackie (1977), further developed in Joyce (2001; 2006).
[66] Posner (1980, p. 43).

for yet more efficient rules. However, the effects of increasing wealth and population on the law were not all positive.

As discussed in Section 3, the move from tribal liability to individual liability was occasioned by increases in population and wealth to avoid free-rider and common pool problems with respect to inter-tribal offenses. However, it is not difficult to see how the misalignment of interests resulting from population growth would also lead to an increased need for intra-tribal mechanisms for deterring inefficient conduct.

In addition, although the increasing collective wealth of communities may have allowed the compensatory modification of *lex talionis* to replace retaliatory violence prior to the dissolution of communal liability, this process would not apply to intra-tribal remedies. Though mostly tangential to our discussion, it is here worth observing that during this phase of legal development, individual property rights would also be emerging, leading to heterogeneity in the personal wealth of community members. Thus, though relatively wealthy communities might be capable of mustering pecuniary compensation for victims of harm caused by its members, there would still be relatively poor individuals within the communities incapable of mustering compensation privately. Thus, as private incentives diverged from the social optimum, these individuals would not be deterred by damages-based deterrence measures.

Thus, as population and wealth increase, we expect that primitive societies will tend to develop a system of criminal law, responding to two pressures. First, the increased need for deterrence in cases of intra-tribal harms; and second, the move from communal to individual liability in cases of intertribal harms. In both cases, the presence of insolvent individuals will undermine the deterrent effect of the compensation mechanism. But recall that the change from retaliatory lex talionis to compensatory lex talionis was a Pareto improving move. Compensation-based deterrence, by forcing injurers to internalize the harms they cause, will tend to create efficient incentives (for wealthy injurers, at least). Communities should therefore be reluctant to abandon (or forgo) compensation-based deterrence, simply because it may be ineffective in a subset of cases. And indeed, ancient civilizations did not do this, but instead invented different mechanisms to effect a different kind of deterrence, where compensation-based deterrence fails: the criminal law.

Additional factors may have contributed to the motivation for development of a criminal law. For activities where victims are unlikely or unable to demand compensation, such as incest or pollution, or where the harm is suffered by the public rather than a particular individual, such as "witchcraft," or treason, the compensation system might not provide adequate (or indeed any) deterrence. In yet other cases, the harm may be so great that the compensation remedy is insufficient to force individuals to internalize the harm. Finally, where injuries to others result in a reduction in tax revenue (e.g., when the injured party is less productive as a result of his injury), then this

represents an additional social harm (above the private harm to the victim), and in such cases, criminal penalties may force potential injurers to internalize this additional cost.[67]

Criminal law as an instrument may also provided additional benefits that civil liability is less capable of achieving. For example, assuming that moral beliefs are at least partly shaped by the law, criminalization may perform an important (albeit difficult to quantify) expressive function – transforming the preferences of community members, and generating a more efficient mix of norms. The expressive effect of the criminal law may also generate focal points, resolving coordination problems for various activities.[68]

To summarize: the principle of lex talionis created a general deterrence against undifferentiated "wrongs." As primitive societies developed, more efficient compensatory mechanisms arose, which later developed into the modern law of torts. However, the deterrent effect of civil liability, while more efficient than lex talionis, is identical neither in magnitude nor scope. Thus, we may regard the criminal law as having arisen to fulfill those functions for which compensation-based deterrence was either insufficient or inapplicable.

6. Conclusion

Historical overviews such as this chapter are not unlike theoretical models. Models pick out features of their explananda as salient, while turning a blind eye to others, to lay bare their essential elements and relations. By forcing reality into a quantifiable framework, models filter an undifferentiated mass of facts into something meaningful – something accessible to analysis. Likewise, no telling of history can be exhaustive; instead, we must choose which aspects of the past to highlight, and which to disregard. In selecting certain features of the past, while ignoring others, we begin to construct a story, abstracted from reality to shine light upon some insight.

In this chapter, we have surveyed the evolution of deterrence in ancient law. We began with the observation that individuals often seem to desire revenge for perceived wrongs committed against them. We offered an explanation for this apparently innate preference in terms of evolutionary psychology: that a disposition for retaliatory behavior acted as a deterrent against other tribes causing harm. Though investment in revenge-seeking was undoubtedly costly, when framed in game theoretic terms, we described how it could represent an efficient equilibrium in repeated-games. We then described the process through which this preference for revenge-seeking transformed into a social norm, constrained by kind-for-kind limitations of discretionary magnitude. Later, an additional measure-for-measure constraint developed to limit spirals of escalating blood feuds. Concomitant with these changes, liability shifted from tribes to individuals.

[67] *See* Posner (1980, pp. 51-52).

[68] For an impressively general theory of law as a mechanism for generating focal points to solve coordination problems, *see* McAdams (2000).

Finally, more specialized tools for effecting deterrence were developed, and the monolithic liability of *lex talionis* branched out on two separate paths: tort liability and criminal liability.

At each stage, we observed that primitive societies tended to adopt norms (later laws) that were efficiency improving. Indeed, each stage of development seems to have been characterized by the adoption of the ever more efficient rules, constrained by severely limiting circumstances. As ancient societies grew in wealth and population, and as state power grew, more efficient rules became available.

Thus, when the broad sweep of legal history is viewed through an economic lens, we are able to identify the deterrence objective undergirding many of the major "paradigm shifts" in the law.[69] From its antediluvian pre-legal origins through to what would eventually become the modern law of torts and criminal law, we have seen the deterrence objective effect an alignment of social and private incentives through a gradual process of accretion. The resilience of the deterrence objective is evident in the remarkable variety of its disparate manifestations in human interaction – from base instinctual response to social norm to legal rule. That the evolution of these apparently distinct realms should share a common cause, to solve and refine a common problem, is a testament to the robustness of the economic forces driving efficiency.

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[69] We are sensitive to possible criticism that applying Kuhn's (1962) concept of "paradigm" to a social practice, such as the law, is a misuse of the term. The mechanisms effecting large-scale transformation in the sciences, identified by Kuhn, are not directly transplantable to the law. Our use of the term should be understood as a loose analogy, upon which nothing essential depends. Certainly, we do not intend to imply the epistemic relativism that many of Kuhn's followers (though not Kuhn himself) endorsed.

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